

## Window Replacement Matrix

	Replacement of a Replacement Window...	Replacement of an Original Window	
		... with a traditional window in-kind	... with a substitute material
For buildings listed on the State or National Register of Historic Places or those buildings found to be eligible* for listing...	<p><b>*If a permit exists for the replacement windows:</b>  <b>Any other replacement window allowed.</b></p> <p><b>Preferred:</b> Wood  Clad  Aluminum  Fiberglass</p> <p><b>Encouraged</b> to make an attempt to match what existed historically in regard to design, dimensions, and visual appearance.</p>	<p><b>No permit required</b> provided that the replacement window matches the original window in regard to design, dimensions, visual appearance, and material.</p> <p>Windows shall be either true divided light, or simulated divided light with muntins factory adhered on the exterior to replicate the visual characteristics of the original window..  Between-the-glass grills do not meet this standard.</p>	<p><b>Preferred</b> – Wood Windows</p> <p><b>Allowed</b> – Wood window with exterior cladding, steel/aluminum windows where original.</p> <p><b>Must</b> match the original in regard to design, dimensions, and visual appearance.</p>
All other buildings	<b>Any replacement window allowed.</b>	<b>No permit required</b> provided that the replacement window matches the original.	<b>Any replacement window allowed.</b>

*\*Eligibility* is determined by recorded Historic Sites and Structures Surveys or a Determination of Eligibility from the Vermont Advisory Council for Historic Preservation.

### **Wood Window Frames**

Wood has been the most used material in window frames for residential housing. Its popularity derives much from its energy efficiency as it is one of the best insulating materials, as well as its natural attractive appearance. Wood frames are also good for intricate custom designs as they are easier to work with. As well, you can stain or paint the wood for a desired look or further customization. Wood does require more maintenance from the consumer. Sealant must be put on the wood fairly frequently to keep their energy efficiency at its best. If the wooden frame is not sealed then moisture can cause the wood to rot and deteriorate. Wood frames also need to be repainted occasionally as changes in the weather will cause any paint used to chip off.

#### **Pros**

- ✓ Energy efficient
- ✓ Custom design (wood finish, intricacy, stains, paint etc.)
- ✓ Natural look
- ✓ Can be repaired
- ✓ Can be painted in different colors
- ✓ Provides a visual and material match for the historic integrity of historic structures

#### **Cons**

- ✓ Requires regular maintenance
- ✓ Wood rot if untreated with sealant or paint at regular intervals

### **Clad Window Frames**

Clad windows offer a great 'have your cake and eat it too' alternative. Clad uses one material on the outside of the window frame and another on the inside. This allows a maintenance free material combined with the benefit of the warm look and feel of a wood frame. Materials most used are aluminum and wood or vinyl and wood. It should be noted though that in some occasions water can still leak in from the vinyl or aluminum material and cause the wood to rot on the inside.

#### **Pros**

- ✓ Outside materials requires little maintenance
- ✓ Warm and natural look with wood in interior
- ✓ Durable outside
- ✓ Improved energy efficiency with inside wood

#### **Cons**

- ✓ If leaks occur the wood may rot and window seals broken.
- ✓ Cannot paint or stain. Limited color selection.
- ✓ Lacks visual appearance of original historic wood windows.

### **Aluminum Window Frames**

Aluminum frames are lightweight and strong. They are good at maximizing window area because of their strength, and can hold large and heavy glass panes. Aluminum frames will not rust, and are offered with anodized finishes. Aluminum is a good thermal conductor, which is bad for cold climates as heat will be lost through the frame. Aluminum frames also allow for condensation to occur on the interior surface of the window. Higher quality aluminum frames will usually have thermal breaks which help insulate the frame and sash better. While these thermal breaks will help, heat could still be lost, making aluminum a less than ideal choice for cold climates.

**Pros**

- ✓ Lightweight
- ✓ Strong
- ✓ No rust
- ✓ Different anodized finishes
- ✓ Little maintenance

**Cons**

- ✓ Loses heat
- ✓ Interior condensation

**Fiberglass Window Frames**

Fiberglass is a more recently available material in window frames. Fiberglass is strong allowing manufacturers to make hollow frames, which can be filled with insulation. Insulation filled fiberglass frames are very energy efficient, and are probably the most durable of the window frame materials. Fiberglass can withstand all the elements that windows have to go through, heat, cold, sunrays, insects, and even water. Frames made from fiberglass will not warp or corrode regardless of climate, and basically require no maintenance. You can paint them to any color you want, and they can hold large heavy panes of glass. The downside to fiberglass window frames is greater expense when compared to most other materials. They also have less of a proven track record for the long term given they are a newer material. The availability of these windows can also be an issue, as they are only manufactured by a few companies.

**Pros**

- ✓ Strong
- ✓ Durable
- ✓ Energy efficient
- ✓ Very little maintenance
- ✓ Can hold heavy panes of glass

**Cons**

- ✓ Fairly expensive
- ✓ No long term track record
- ✓ Not readily available everywhere

**Vinyl Window Frames**

Vinyl is one of the more popular materials used in window frames today. It requires very little maintenance, and it is a flexible material allowing it to be put into various shaped and sized openings for window replacement. Vinyl windows are moderately energy efficient, though it can depend on the quality of window. They are durable as they will not corrode, peel, or shrink, and they are relatively inexpensive. Vinyl does not require painting because you can get it in a variety of colors and the color is through the entire material which helps reduce the visibility of any scratches. On the down side, vinyl frames are not very strong so it often looks bulkier since they can't be made as thin to support the windows. They are also limited to the size and weight they can hold for a window pane.

**Pros**

- ✓ Flexible
- ✓ Moderately durable
- ✓ Little maintenance
- ✓ Inexpensive
- ✓ Reduced scratch visibility
- ✓ Wide variety of styles and colors
- ✓ Moderately energy efficient

**Cons**

- ✓ Weaker material
- ✓ Limited to size and weight of window pane
- ✓ Shorter life expectancy
- ✓ Due to light weight, seals frequently break and windows cloud, spurring replacement

- Frequent appearance of distortion in the window glazing, offered a “warped” sensation in the window glass
- Hardware is typically made of similar plastics; failure in repeated use common.
- Do not exhibit visual characteristics of original wood windows.